EN[illegible] REGIONAL OPERATIONS & LABORATORIES DIV.

WATER QUANTITY AND QUALITY SURVEY
GAUTHIER SUBDIVISION
TOWN OF RAYSIDE-BALFOUR

MAY 1977

Ministry
of the
Environment

Ontario

Gord Johnson
Dist Officer

~~Limited distribution~~

WATER QUANTITY AND QUALITY SURVEY

GAUTHIER SUBDIVISION

TOWN OF RAYSIDE-BALFOUR

MAY 1977

Prepared by: Northeastern Region
Municipal & Private Abatement Section

Sudbury District

841-522-8282

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INTRODUCTION

At the Regional Municipality of Sudbury MOE Liaison Committee meeting on March 12, 1976, it was agreed that Ministry of the Environment staff would conduct a water quality and quantity survey in the Gauthier Subdivision area of the Town of Rayside-Balfour. This survey was considered necessary in order to establish the urgency for the proposed communal water and sewer services. No previous pollution studies had been carried out in the area.

Gauthier Subdivision is situated North of the Canadian Pacific Railway line and Hwy. 144 in the community of Azilda (Appendix A) and consists of two crescents running west from Marier Street and the scattered development along Labine Street from Marier Street to Principal Street.

The Raymond, Denis Crescent and Commercial Avenue area is well developed with fifty-eight of the sixty-seven lots containing single family dwellings at the time of the survey. Labine Street from Marier Street to Principal Street is sparsely populated with thirty homes located along it's forty-five hundred foot length.

The entire area is relatively flat and level. Surface water was confined to a few ditches at the time the survey was carried out. Surficial soils are mostly of a clay nature thereby requiring that fill be imported for the construction of leaching beds for sub-surface sewage disposal systems. All homes in the area utilize sub-surface sewage disposal systems and obtain potable water from groundwater sources.

SAMPLING PROCEDURE

Water samples were collected by staff on three sampling sessions during the summer of 1976. The first session was on June 22, 23 and 24 and the second on July 22 and 26. The Labine Street area was added to the area to be surveyed at the request of the Town of Rayside-Balfour and was sampled on August 4, 1976. Water supplies in the Denis Crescent, Commercial Avenue and Raymond Crescent area were sampled for bacteriological quality during the first and second sessions. During the first sampling session a questionnaire was filled out by staff in the presence of the occupant. Information regarding water supply and sewage disposal was recorded on the form along with the lot sizes, drainage and the users opinion of the water supply. A copy of the questionnaire is appended to this report.

Samples were collected and delivered to the Sudbury & District Health Unit the same day for bacteriological examination. If the results were positive in any of the water supplies the residents were notified by letter, a copy of which was sent to the Sudbury & District Health Unit. Wells which were sampled during the first sampling session were re-sampled during the second session. Any surface water observed during the survey was sampled and examined for bacteria.

During the third sampling session water samples were collected at eight of the thirty homes on Labine Street and examined for bacteriological quality.

Water samples were also collected for chemical analysis. These samples were sent to the Ministry of the Environment Laboratories in Toronto and analyzed for hardness, alkalinity, iron, chloride, pH, conductivity, nitrate and sulphate. Colour and turbidity analyses were also carried out on a number of the samples. These parameters it was felt would give an overall indication of the water quality, and coupled with the bacteriological examination results, would tend to indicate if there were any malfunctioning sub-surface sewage disposal systems.

The location and sample number for each water supply sampled is shown on the plan (Appendix E).

A soil auger was used to extract soil to a depth of five feet. A field analysis of the soil was made at each of the four locations sampled.

SAMPLE RESULTS

Bacteriological Quality

Fifty wells were sampled during the first survey session on June 22, 23 and 24. In addition one sample was collected from a ditch on the corner of Raymond Crescent and Marier Street. Of the fifty wells sampled, two water supplies showed the presence of coliform organisms. Sample No. GS34 had counts of 80 for total coliform organisms and 8 for faecal coliforms. Sample No. GS48 had counts of 8 and 0 respectively. The ditch which was the only surface water ponding observed on that date showed counts of 80+ for both total coliform organism and faecal coliforms.

During the second sampling session on July 22 and 26, forty-eight wells in the same area were sampled, the majority of which had been sampled during the previous session. One sample No. GS48 showed counts of 4 total coliform organisms. Bacteria had been detected in this water supply on the first sampling session. The other water supply GS34 which had counts on the first sampling session showed no bacteria present during the second sampling session.

Of the eight samples collected on Labine Street, on August 4, one sample No. GS63 had counts of 2 total coliform organisms.

Chemical Analysis

Nitrate concentrations were found to be above this Ministry's recommended limits of 10 mg/l in three of the wells sampled in the Denis Crescent area and one well on Labine Street.

The sample numbers of the affected supplies were GS2, GS14, GS43 and GS61. The water supplies where high nitrates were found are spread throughout the survey area and are not concentrated in any specific portion.

Iron concentration above this Ministry's desirable criteria of 0.3 mg/l were detected in twenty-eight of the water supplies sampled. High iron appears to be a problem in a large proportion of the area surveyed.

Hardness and alkalinity were above average in the majority of the supplies sampled. However this Ministry has no recommended limits for hardness and alkalinity since neither appear to pose health hazards.

Conductivity, which is a measure of the waters dissolved ion concentration, was above average in a number of cases. Conductivity or specific conductance which it is often called can be directly related to dissolved solids. Although the readings were high in many cases this Ministry has no recommended limits for dissolved solids.

Colour and turbidity were above this Ministry's recommended limits of 5 and 1 unit respectively in several of the wells sampled. In most cases this can be attributed to high iron concentrations in the supply.

Sulphates were well below this Ministry's desirable criteria of 250 mg/l in all potable water supplies sampled.

FIELD SOIL DETERMINATIONS

Soil sampling and field analysis were made during the first survey session. It was found that clay type soils extended to a depth of five feet at the four points sampled. Granular fill has had to be imported for the construction of leaching beds for sub-surface sewage disposal systems in the area.

WATER QUANTITY

Of the sixty-four homes surveyed, ten residents reported problems with the adequacy of their water supply. Most of these complaints were restricted to the summer of 1975 which was an extremely dry summer.

Of the sixty-four homes surveyed, two had drilled wells while the remainder had point wells varying in depth from twelve to fifty feet with the majority around the twenty to thirty foot mark. The major water supply problem in the area was the clogging of the sand points which required their periodic replacement.

SUMMARY

Most of the sewage disposal systems in the area had been constructed within the past fifteen years with a few having been replaced more recently. No obvious malfunctioning of the sewage systems was observed during the survey.

During the survey fifty-six of the fifty-eight (or 96%) water supplies in the Denis Crescent area were sampled along with eight of the thirty (or 26%) of the supplies on Labine Street. Of the supplies sampled in the Denis Crescent area two had adverse bacteriological results as did one of the homes sampled on Labine Street.

Nitrates were above this Ministry's recommended limits of 10 mg/l in three of the supplies in the Denis Crescent area and one of the supplies on Labine Street.

A large percentage (44%) of the supplies sampled in the Denis Crescent and 37% of the supplies on Labine Street had iron concentrations above this Ministry's desirable criteria for a potable water supply. Iron is considered to be an aesthetic problem rather than a health hazard.

Apparent colour was above this Ministry's objectives in 50% and turbidity in 43% of the wells sampled in the Denis Crescent area. The majority of the samples having high colour and turbidity also contained high iron concentrations. Iron could be responsible for a large percentage of the colour and turbidity in the water supplies. A considerable amount of iron, colour and turbidity has been successfully removed with the use of small filter units on private supplies.

Of the sixty-four homes surveyed 10 residents (15%) reported that a water shortage existed. Since all but one of these wells is less than thirty feet in depth it is expected that an increase in well depth would help to rectify some of the problems encountered.

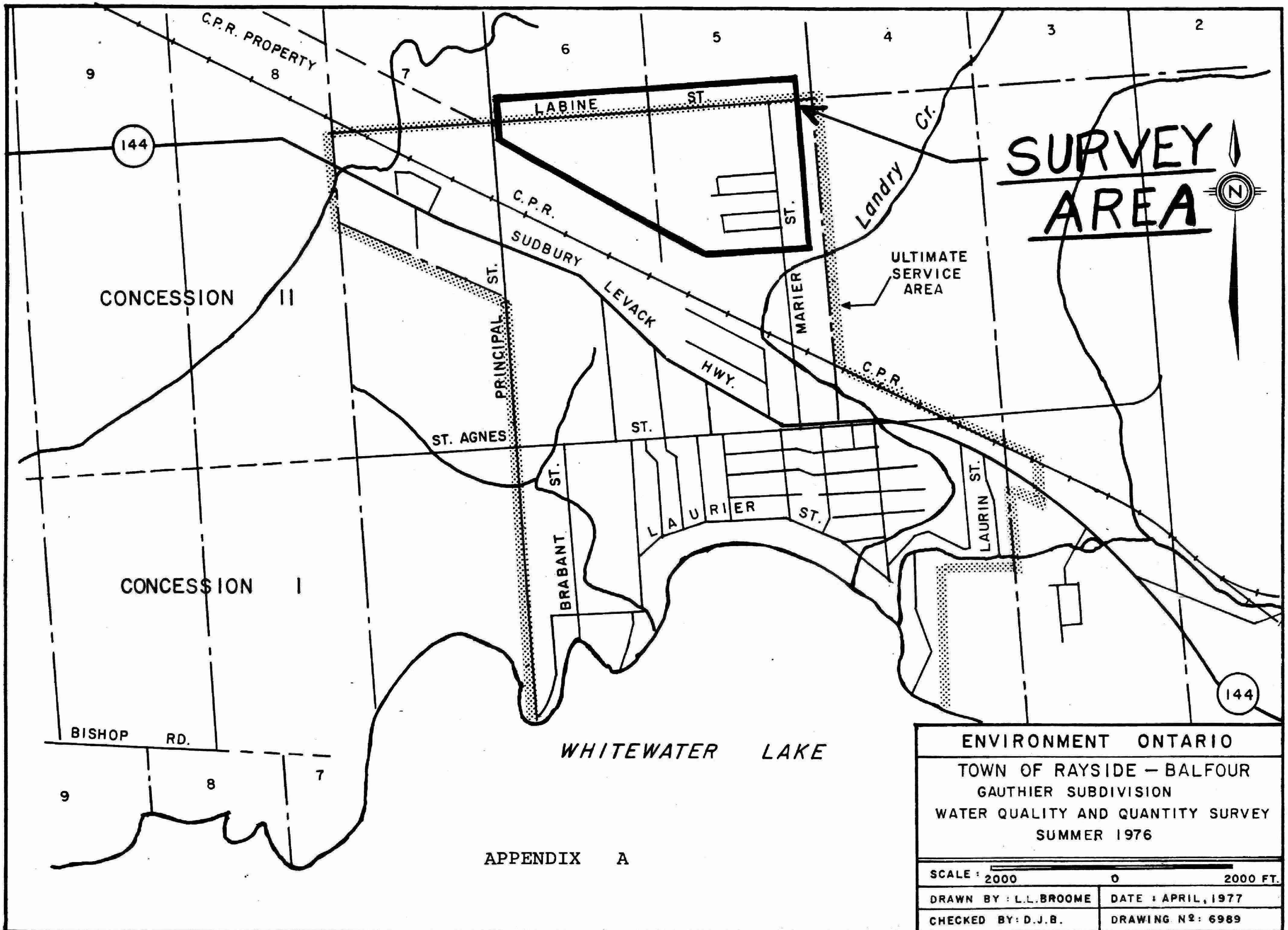
CONCLUSIONS

The bacteriological and nitrate analyses results combined with the visual inspection of septic tank and leaching bed locations at the time of the survey indicates that there is little contamination of wells caused by malfunctioning sewage systems in the area. The contamination noted could be rectified by disinfection of the affected wells and upgrading of the individual sub-surface sewage disposal systems.

The majority of the water quality problems detected during the survey were of an aesthetic nature rather than of health hazards. However, a large number of homes utilize groundwater which is aesthetically unpleasing. The water supplies could be improved by the use of filtration and purification on an individual basis.

The survey results indicate that the private sewage disposal systems are operating properly and have not impaired the groundwater.

Since the present quality of the groundwater does not pose a threat to the health of the residents and there appears to be an adequate quantity of water available, the provision of communal water and sewer services is not considered to be urgent.


SURVEY AREA
N
C.P.R. PROPERTY
C.P.R.
LABINE ST.
MARIER ST.
Landry Cr.
ULTIMATE SERVICE AREA
SUDBURY LEVACK HWY.
PRINCIPAL ST.
ST. AGNES ST.
LAURIER ST.
BRABANT ST.
LAURIN ST.
CONCESSION II
CONCESSION I
144
BISHOP RD.
WHITEWATER LAKE
9
8
7
6
5
4
3
2
ENVIRONMENT ONTARIO
TOWN OF RAYSIDE — BALFOUR
GAUTHIER SUBDIVISION
WATER QUALITY AND QUANTITY SURVEY
SUMMER 1976
SCALE : 2000 0 2000 FT.
DRAWN BY : L.L.BROOME
DATE : APRIL, 1977
CHECKED BY: D.J.B.
DRAWING Nº: 6989

APPENDIX A

PRINT ALL INFORMATION

SURVEY FORM

QUESTIONNAIRE

APPENDIX B

COMMUNITY: __ __ ______________________________

INFORMATION RECEIVED FROM: ____________________

SURVEYED BY: __________________________________

SAMPLE INFORMATION

	Bacteriological		Chemical	
Type				
Sample No.				
Sample Location				
Results	Total	Faecal	Total	Faecal

PROPERTY INFORMATION

Name of Owner ______________________ Owner's Phone No. __________

Permanent Address ______________________________

Name of Resident ______________________________

Lot No.	Conc.No.	Township	Community	Street Address	Phone No.

Size of Lot	Drainage	Topography	Soil Type

No. of Residents	No. of Bedrooms	Laundry Facilities	Other

SEWAGE DISPOSAL SYSTEM

Type	Septic Tank ______ Tile Bed ______ (enter distances)	Leaching Pit	Pit Privy	Other (Specify)

Age	Distance to Surface Water	Distance to Water Supply	

Comments: ______________________________

	Note Quantity

WATER SUPPLY

Type	Surface Water	Dug Well	Drilled Well	Cased Well	Point

Depth	Age	Type & Capacity of Pressure System	Type of Pipe	Chlorinator	Filtration

Comments:	Taste	Odour	Colour	Iron	Hardness	Quantity	Quality	

DIAGRAM ON REVERSE SIDE SHOWING LOCATION AND DISTANCES FOR WATER SUPPLY AND SEWAGE DISPOSAL

TABLE 1

APPENDIX C

Town of Rayside-Balfour
Gauthier Subdivision
Water Quality & Quantity Survey
Summer 1976

Date: **June 22, 23, 24, 1976**

CHEMICAL ANALYSIS RESULTS

	SAMPLE LOCATION	Hardness as $CaCO_3$ mg/l	Alkalinity as $CaCO_3$ mg/l	Iron as Fe mg/l	Chloride as Cl mg/l	pH at Lab	Apparent Colour H.U.	Turbidity F.T.U.	Conductivity µmhos/cm	Nitrate as N mg/l	Sulphate as SO_4 mg/l
GS-1	**L. St.George**	**452**	**329**	**.50**	**23**	**7.1**	**10**	**.45**	**825**	**2.1**	**120.**
GS-1A	**Ditch**	**428**	**422**	**.25**	**30**	**7.7**	**50**	**36.**	**1105**	**.8**	**210.**
GS-2	**N. Decosse**	**488**	**388**	**.10**	**78**	**7.1**	**10**	**1.1**	**1135**	**15.**	**94.**
GS-3	**D. St.George**	**364**	**278**	**.10**	**4**	**7.3**	**5**	**.49**	**620**	**.6**	**71.**
GS-4	**D. St.George**	**404**	**305**	**.05**	**16**	**7.3**	**5**	**.40**	**700**	**.6**	**79.**
GS-6	**D. St.Cyr**	**348**	**267**	**.05**	**4**	**7.3**	**5**	**.61**	**695**	**.61**	**.1**
GS-7	**452 Raymond St.**	**270**	**216**	**< .05**	**4**	**7.6**	**5**	**.33**	**480**	**.2**	**54**
GS-8	**D. Poulin**	**262**	**212**	**.05**	**3**	**7.5**	**5**	**.28**	**455**	**.2**	**47.**
GS-9	**R. Delorme**	**266**	**213**	**.60**	**5**	**7.4**	**30**	**3.0**	**468**	**.1**	**49.**
GS-10	**L. Kendziora**	**216**	**163**	**< .05**	**3**	**7.6**	**5**	**.24**	**390**	**.2**	**49.**
GS-11	**R. Dugas**	**286**	**233**	**1.1**	**6**	**7.4**	**30**	**4.9**	**496**	**.2**	**45.**
GS-12	**G. Gelineau**	**448**	**339**	**< .05**	**37**	**7.1**	**5**	**.26**	**830**	**6.0**	**64**
GS-14	**G. Paquette**	**404**	**288**	**< .05**	**46**	**7.3**	**5**	**.26**	**760**	**4.4**	**59.**
GS-15	**P. Carlyle**	**314**	**233**	**< .05**	**14**	**7.4**	**5**	**.51**	**560**	**.8**	**61.**
GS-16	**N. Pitre**	**408**	**335**	**< .05**	**23**	**7.1**	**5**	**.27**	**740**	**1.9**	**52.**
GS-18	**M. Gauthier**	**294**	**227**	**< .05**	**4**	**7.4**	**5**	**.28**	**510**	**.2**	**58.**
GS-17	**N. Fortin**	**332**	**253**	**.10**	**11**	**7.3**	**5**	**.37**	**595**	**.8**	**69.**
GS-19	**J. Veitch**	**384**	**282**	**.20**	**5**	**7.3**	**5**	**.35**	**650**	**.6**	**88.**
GS-20	**J. Pigeon**	**352**	**233**	**< .05**	**30**	**7.4**	**5**	**.62**	**680**	**3.6**	**79.**
GS-22	**J. Breton**	**572**	**406**	**< .05**	**61**	**7.1**	**5**	**.26**	**1060**	**5.6**	**100.**

Town of Rayside-Balfour
Gauthier Subdivision
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Summer 1976

TABLE 1 (Con't)

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Date: June 22, 23, 24, 1976

CHEMICAL ANALYSIS RESULTS

SAMPLE LOCATION		Hardness as $CaCO_3$ mg/l	Alkalinity as $CaCO_3$ mg/l	Iron as Fe mg/l	Chloride as Cl mg/l	pH at Lab	Apparent Colour H.U.	Turbidity F.T.U.	Conductivity µmhos/cm	Nitrate as N mg/l	Sulphate as SO_4 mg/l
GS-23	M. Topolinisky	456	347	1.2	22	7.3	80	19.	830	< .1	120.
GS-29	L. Gervais	456	312	3.2	18	7.5	120	33	780	.2	130
GS-31	H. Bardine	380	275	.60	18	7.4	20	5.4	670	.1	87
GS-32	B. Huzij	516	405	< .05	54	7.4	5	.44	980	1.7	79
GS-33	E. Schroeder	524	434	.25	52	7.1	5	1.0	1020	1.8	74
GS-34	G. Lalande	372	264	.20	11	7.3	15	1.1	630	.6	80
GS-35	R. Hebert	484	389	< .05	44	7.2	5	.22	930	.7	77
GS-37	R. Arseneay	332	235	.40	11	7.4	15	2.4	580	2.0	73
GS-35A	Ditch	360	541	5.0	95	8.0	1200	51.	1260	.8	60
GS-36	419 Denis St.	384	274	< .05	19	7.3	5	.14	670	2.1	70
GS-38	R. Lalande	404	298	< .05	25	7.3	15	.35	720	1.2	74
GS-40	K. Blacklock	384	247	< .05	9	7.3	15	.23	600	.7	78
GS-42	D. Pelland	500	363	.05	39	7.2	15	.50	930	3.6	110
GS-43	A. Larose	344	244	< .05	13	7.3	5	.14	598	.7	73
GS-44	E. Emblin	440	338	< .05	29	7.2	5	.35	835	2.0	96
GS-5	V. Martin	244	258	7.9	10	7.7	120	100	490	< .1	15
GS-13	A. Dugay	282	219	.45	6	7.5	20	2.0	490	.4	51
GS-21	G. Guibeault	468	304	1.2	26	7.4	80	18	790	< .1	130
GS-24	R. Theriault	8	293	3.3	6	7.6	160	18	600	< .1	41
GS-26	K. Lye	472	301	5.8	33	7.3	240	52	790	< .1	120

TABLE 1 (Con't)

APPENDIX C

Town of Rayside-Balfour
Gauthier Subdivision
Water Quality & Quantity Survey
Summer 1976

Date: June 22, 23, 24, 1976

CHEMICAL ANALYSIS RESULTS

SAMPLE LOCATION		Hardness as $CaCO_3$ mg/l	Alkalinity as $CaCO_3$ mg/l	Iron as Fe mg/l	Chloride as Cl mg/l	pH at Lab	Apparent Colour H.U.	Turbidity F.T.U.	Conductivity µmhos/cm	Nitrate as N mg/l	Sulphate as SO_4 mg/l
GS-27	493 Denis Cres.	528	398	4.9	57	7.2	200	46	980	< .1	94
GS-28	462 Denis Cres.	560	330	6.0	151	7.2	240	55	1150	< .1	99
GS-30	45 Denis Cres.	408	284	1.8	20	7.6	80	17	705	< .1	100
GS-56	351 Denis Cres.	448	281	1.2	20	7.5	20	16.	725	.1	90
GS-50	J. Steen	420	281	6.4	53	7.1	240	47.	750	< .1	62
GS-46	G. Joly	456	327	.05	26	7.2	15	.23	800	3.1	79
GS-39	425 Denis Cres.	352	256	.05	25	7.2	5	.27	620	1.1	54
GS-45	C. Tuttle	440	312	.05	21	7.4	5	.55	780	7.0	75
GS-47	352 Denis Cres.	404	281	1.2	20	7.5	70	15.	690	.1	86
GS-48	R. Theriault	376	341	8.0	60	7.0	160	47.	960	.1	120
GS-52	299 Denis Cres.	282	248	5.6	3	7.2	240	14.	489	.2	30

Town of Rayside-Balfour
Gauthier Subdivision
Water Quality & Quantity Survey
Summer 1976

TABLE 2

APPENDIX C

Date: **July 22,26, 1976**

CHEMICAL ANALYSIS RESULTS

	SAMPLE LOCATION	Hardness as $CaCO_3$ mg/1	Alkalinity as $CaCO_3$ mg/1	Iron as Fe mg/1	Chloride as Cl mg/1	pH at Lab	Apparent Colour H.U.	Turbidity F.T.U.	Conductivity μmhos/cm	Nitrate as N mg/1	Sulphate as SO_4 mg/1
GS-1	**L. St.George**	**460**	**319**	**.05**	**19**	**7.2**			**820**	**1.8**	**120**
GS-2	**N. DeCosse**	**560**	**416**	**1.7**	**102**	**7.1**			**1360**	**18.**	**120.**
GS-3	**D. St.George**	**364**	**270**	**.40**	**6**	**7.4**			**610**	**.6**	**73**
GS-4A	**C. LeClair**	**476**	**350**	**.15**	**22**	**7.3**			**835**	**4.0**	**83**
GS-4	**D. St.George**	**428**	**320**	**< .05**	**22**	**7.2**			**770**	**1.5**	**79**
GS-6	**439 Raymond St.**	**322**	**243**	**< .05**	**	**8.1**			**550**	**< .1**	**67**
GS-5	**V. Martin**	**234**	**258**	**4.8**	**8**	**7.8**			**490**	**< .1**	**11**
GS-7	**452 Raymond St.**	**262**	**204**	**< .05**	**3**	**7.6**			**475**	**.2**	**51**
GS-8	**D. Poulin**	**250**	**201**	**.20**	**3**	**7.7**			**451**	**.2**	**45**
GS-9	**R. Delorme**	**264**	**208**	**.55**	**4**	**7.6**			**470**	**.1**	**44**
GS-10A	**R. Dellaire**	**250**	**181**	**< .05**	**5**	**7.5**			**455**	**.1**	**57**
GS-11	**R. Dugas**	**298**	**229**	**2.1**	**8**	**7.4**			**520**	**1.4**	**46**
GS-12	**G. Gelineau**	**464**	**330**	**.10**	**41**	**7.2**			**850**	**6.5**	**62**
GS-13	**A. Duguay**	**282**	**216**	**.40**	**5**	**7.4**			**500**	**< .1**	**52**
GS-14	**71 Commercial St.**	**196**	**283**	**.20**	**20**	**7.4**			**720**	**10.**	**60**
GS-16	**N. Pitre**	**348**	**276**	**.20**	**18**	**7.3**			**640**	**.3**	**54**
GS-15	**P. Carlyle**	**322**	**234**	**< .05**	**15**	**7.5**	**< 5**		**570**	**.6**	**61**
GS-17	**N. Fortin**	**320**	**237**	**< .05**	**7**	**7.4**	**< 5**		**560**	**.4**	**65**
GS-18	**M. Gauthier**	**292**	**221**	**< .05**	**3**	**7.5**	**< 5**		**510**	**.2**	**57**
GS-20	**J. Pigeon**	**520**	**250**	**< .05**	**17**	**7.4**	**5**		**630**	**3.8**	**66**

Town of Rayside-Balfour
Gauthier Subdivision
Water Quality & Quantity Survey
Summer 1976

TABLE 2 (Con't)

APPENDIX C

Date: **July 22, 26, 1976**

CHEMICAL ANALYSIS RESULTS

	SAMPLE LOCATION	Hardness as $CaCO_3$ mg/l	Alkalinity as $CaCO_3$ mg/l	Iron as Fe mg/l	Chloride as Cl mg/l	pH at Lab	Apparent Colour H.U.	Turbidity F.T.U.	Conductivity µmhos/cm	Nitrate as N mg/l	Sulphate as SO_4 mg/l
GS-21	**G. Guibeault**	3	319	.05	24	7.6	5	-	900	< 1	120
GS-22	**J. Breton**	540	373	< .05	62	7.1	5		1030	4.9	110
GS-23	**M. Topolnisky**	456	339	1.0	20	7.3	30		830	< .1	120
GS-24	**R. Theriault**	232	245	7.5	3	7.1	240		510	< .1	48
GS-26	**K. Lye**	460	299	4.8	30	7.4			790	< .1	120
GS-27	**V. Haluschak**	524	393	3.5	52	7.2			990	< .1	100
GS-28	**H. Maitland**	584	333	6.5	155	7.2			1200	< .1	100
GS-29	**L. Gervais**	444	312	2.0	16	7.4			790	< .1	120
GS-30	**K. R. Coon**	400	285	1.7	15	7.5			710	< .1	110
GS-33	E. Schrogoer	476	401	.05	44	7.1			960	2.0	77
GS-32	R. Huzit	504	406	.05	48	7.1			990	2.2	78
GS-37	R. Arseweah	336	235	.65	11	7.3			590	.6	78
GS-34	G. Lalonde	420	328	.05	25	7.4			900	1.1	
GS-36	A. Gauthier	388	283	.45	17	7.6			780	< .1	
GS-38	R. Lalande	428	324	< .05	20	7.4			780	6.2	
GS-39	C. Beaulieu	468	346	.05	28	7.4			825	4.3	
GS-40	K. Blacklock	9	399	.50	68	7.4			1105	< .1	
GS-40A	W. Proulx	416	291	1.9	50	7.1			760	< .1	
GS-41	E. Lange	428	299	.55	18	7.1			700	< .1	
GS-43	A. Larose	528	386	.15	54	7.1			1250	16	

Town of Rayside-Balfour
Gauthier Subdivision
Water Quality & Quantity Survey
Summer 1976

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APPENDIX C

Date: July 22, 26, 1976

CHEMICAL ANALYSIS RESULTS

	SAMPLE LOCATION	Hardness as $CaCO_3$ mg/l	Alkalinity as $CaCO_3$ mg/l	Iron as Fe mg/l	Chloride as Cl mg/l	pH at Lab	Apparent Colour H.U.	Turbidity F.T.U.	Conductivity µmhos/cm	Nitrate as N mg/l	Sulphate as SO_4 mg/l
GS-44	E. Emblin	372	275	.20	11	7.3			700	.6	
GS-44A	L. Sabourin	416	292	< .05	20	7.3			740	2.2	
GS-45	C. Tuttle	380	302	< .05	22	7.3			770	1.0	
GS-46	G. Joly	348	260	.05	24	7.4			680	2.0	
GS-48	R. Therriault	368	261	< .05	12	7.3			680	.6	
GS-55	J. Steen	420	310	.05	27	7.2			830	2.4	
GS-56	C. Bertrand	540	434	< .05	60	7.2			1260	8.3	
GS-57	A. Belanger	344	256	< .05	15	7.4			680	.8	

Town of Rayside-Balfour
Gauthier Subdivision
Water Quality & Quantity Survey
Summer 1976

TABLE 3

APPENDIX C

Date: **August 4, 1976**

CHEMICAL ANALYSIS RESULTS

	SAMPLE LOCATION	Hardness as $CaCO_3$ mg/l	Alkalinity as $CaCO_3$ mg/l	Iron as Fe mg/l	Chloride as Cl mg/l	pH at Lab	Apparent Colour H.U.	Turbidity F.T.U.	Conductivity µmhos/cm	Nitrate as N mg/l	Sulphate as SO_4 mg/l
GS-60	L. Belanger	439	302	< .05	40	7.2			850	2.2	
GS-61	A. Metthe	536	298	.20	40	7.2			1100	17.	
GS-62	R. Parisoto	344	277	.45	21	7.7			645	.2	
GS-63	G. Certossi	162	246	2.7	13	8.0			445	< .1	
GS-64	J. C. Sullivan	424	286	.10	22	7.1			780	.1	
GS-65	O. Couture	22	253	.25	4	7.6			560	< .1	
GS-66	A. Clapp	144	234	.35	7	7.8			420	< .1	
GS-67	J. Chrapchynski	326	273	.05	17	7.4			580	.4	

GLOSSARY

(i) BACTERIOLOGICAL EXAMINATION

Total Coliform Organisms

Total coliform organisms include a wide variety of bacteria ranging from the genus (Group), Escherichia Coli, which originate mainly in the intestines of man and other warm-blooded animals, to the genera Citrobacter and Enterobacter aerogenes. The latter genera are basically found in soil but are also present in faeces in small numbers.

The presence of total coliforms in water may indicate soil runoff or more important, less recent faecal pollution since organisms of the Enterobacter - Citrobacter groups tend to survive longer in water than do members of the Escherichia Coli group, and even multiply when suitable environmental conditions exist.

Faecal Coliform Organisms

The faecal coliform organisms are those coliform bacteria which are all intestinal in origin and usually outnumber all other coliform types in human and animal intestines. Most of the coliform bacteria found by the faecal coliform test are of the genus Escherichia Coli. However, their death rate outside the warm body is high and accordingly if coliforms present in the water are primarily faecal coliforms, and their number is high, the pollution is probably nearby and recent. Smaller numbers with a high portion of faecal coliforms may indicate nearby pollution with counts reduced by dilution.

Results are reported "coliform count per 100 millilitres".

(ii) CHEMICAL ANALYSIS

Hardness

The total hardness measures the "soap consuming power" of a water due to the presence of metallic cations. The principle components of hardness are calcium and magnesium although a number of heavy metals may contribute to a small extent. The hardest waters are usually encountered in regions with thick top soil layers and extensive limestone deposits.

Hard waters are objectionable because they form insoluble compounds or curds with soap. This substantially reduces the efficiency of washing procedures even when detergents are used. Waters with high hardness are know to cause the formation of a lime scale in plumbing fixtures.

Alkalinity

The alkalinity of the water is generally used to define the buffering capacity or the waters capability to resist a change in pH. This means that if an acidic waste is discharged to a natural water system the effect on the water may not necessarily be detected as a pH change but will be detected as a drop in alkalinity.

Iron

Iron is the most abundant of the heavy metals in nature, but despite this abundance, it is generally found in relatively low levels in natural surface waters. Iron is non-toxic even at high levels but becomes objectionable in water because of the colour and bitter taste it imparts. The water quality objective for Ontario drinking water is 0.3 mg/l as iron.

Chloride

Chloride is a major anion in domestic wastes and in many natural water supplies. Urban runoff often contains high concentrations of chloride in the winter time due to road application of salt.

Chloride poses no direct health hazard, but the water quality objective for domestic water supplies has been specified at 250 mg/l to prevent a salty taste. This salty taste is variable and dependent on the composition of the water. If chloride is present as sodium chloride a dectectable taste will be present at 250 mg/l. If chloride is present as calcium or magnesium chlorides, waters containing as much as 1,000 mg/l may not have a noticeable taste.

pH

The Hydrogen Ion concentraction in water is measured as pH. Specifically, it is the negative logarithm of the hydrogen ion concentration expressed in moles per litre. Thus, each change of one unit in pH corresponds to a 10 fold change in the hydrogen ion concentration.

Apparent Colour Units

Many lakes and rivers, especially in Northern Ontario, have a characteristic yellowish-brown colour due to the presence of humic acids derived from the decomposition of plants. Lakes of this type are commonly referred to as "acid bog" or "brown water" lakes. A similar colour may also occur when iron and maganese are found in abundance.

Water coloured naturally by humic substances is harmless, but considered unacceptable for drinking purposes because of its appearance. The objective of 5 colour units for domestic water supplies is therefore based on aesthetic rather than on health standards.

Turbidity

The turbidity is a measure of the opticle properties of a sample which causes light to be scattered and adsorbed rather than transmitted in a straight line. Historically, the turbidity was measured using a Jackson candle turbidmeter, but the insensitivity of this instrument lead to the development of secondary techniques which can measure the much lower turbidities commonly encountered in modern water treatment processes.

Specific Conductance

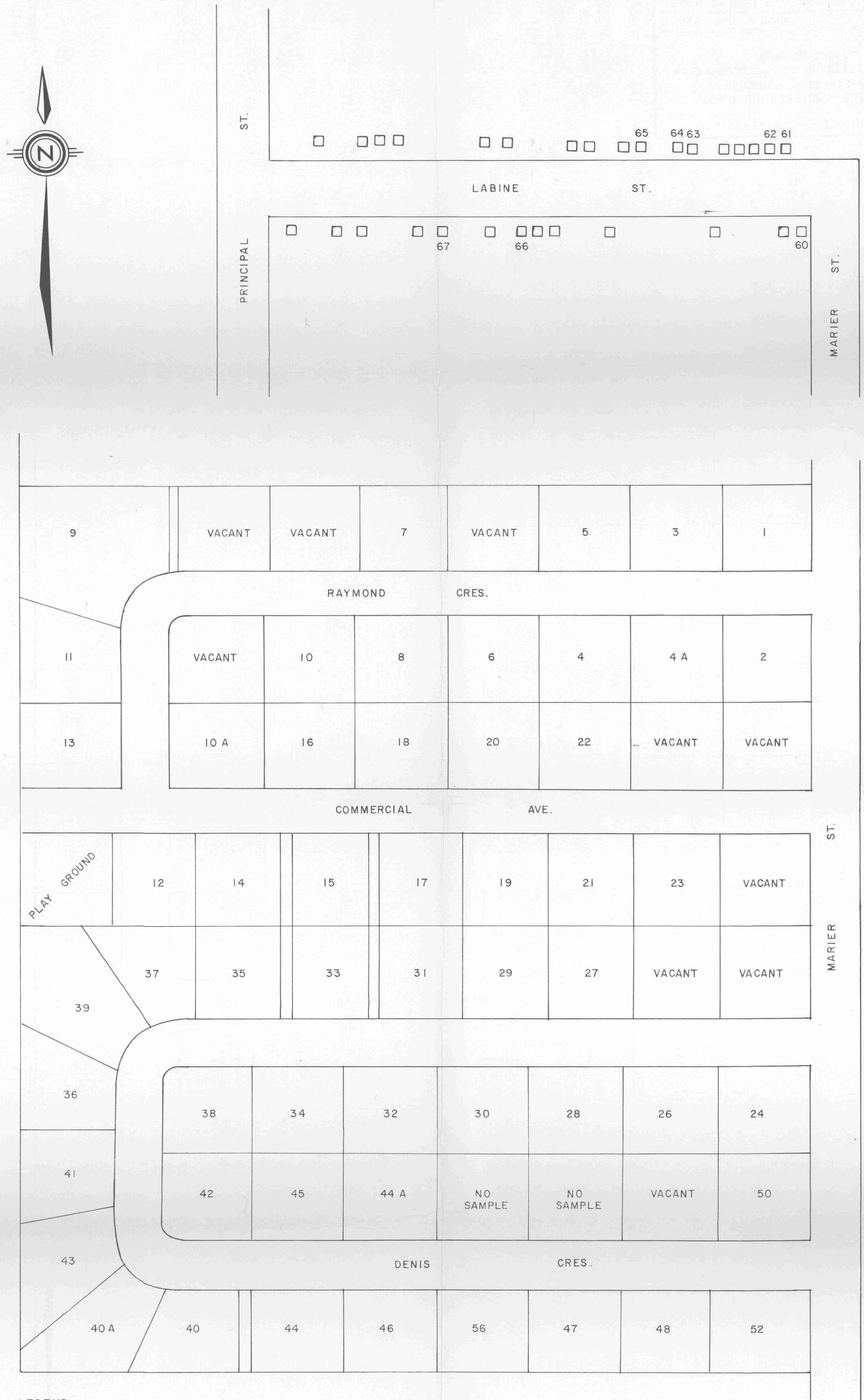
The specific conductance is a measure of a waters capacity to carry an electric current. This property is related to the total concentration of ionized substances in the water. The conductivity of natural waters is mainly due to the presence of calcium, magnesium, sodium, pottassium, bicarbonate, chloride, sulphate and nitrate ions.

Specific conductance related quite well to the total dissolved solids concentration. Ontario rivers and lakes free of industrial wastes, have a total dissolved solids concentration generally equal to 0.65 ± 0.10 x the specific conductance.

Nitrate (Nitrogen)

Nitrates are formed via the oxidation of nitrite by autotrophic nitrifying bacteria and represents the most highly oxidized form of nitrogen in the nitrogen cycle. It is generally found at trace levels in all surface waters but may become very high in ground waters as a result of soil leaching.

Nitrates are objectionable because their nutritive properties promote the excessive growth of algae and other aquatic plants. Excessive amounts in drinking water contribute to a disease known as infant methemoglobinemia in which the oxygen carrying capacity of the blood is inhibited. The maximum acceptable level for domestic water supplies in Ontario is 10 mg/l of nitrate as nitrogen in the water if it is to be used for infant feeding. Nitrates are non-toxic to adults.



LEGEND

43 – LOCATION AND SAMPLE NUMBER

MINISTRY OF THE ENVIRONMENT

TOWN OF RAYSIDE – BALFOUR
GAUTHIER SUBDIVISION
WATER QUALITY AND QUANTITY SURVEY
SUMMER 1976

SCALE : Not to Scale	
DRAWN BY : L.L.B.	DATE : APRIL, 1977
CHECKED BY : G.J.	DRAWING Nº: 6991